NOTICE OF ALLOWANCE AND FEE(S) DUE

28289   7590   07/08/2008

THE WEBB LAW FIRM, P.C.
700 KOPPERS BUILDING
436 SEVENTH AVENUE
PITTSBURGH, PA 15219

EXAMINER
AKINTOLA, OLABODE

ART UNIT	PAPER NUMBER
3691	

DATE MAILED: 07/08/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,238	07/11/2003	Craig E. Boutilier	3819-030682	4643

TITLE OF INVENTION: METHOD AND APPARATUS FOR SOLVING CONCISELY EXPRESSED COMBINATORIAL AUCTION PROBLEMS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$720	$300	$0	$1020	10/08/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: <u>Mail</u> Mail Stop ISSUE FEE
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or <u>Fax</u> (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

_____ (Depositor's name)

_____ (Signature)

_____ (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,238	07/11/2003	Craig E. Boutilier	3819-030682	4643

TITLE OF INVENTION: METHOD AND APPARATUS FOR SOLVING CONCISELY EXPRESSED COMBINATORIAL AUCTION PROBLEMS

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nonprovisional	YES	$720	$300	$0	$1020	10/08/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
AKINTOLA, OLABODE	3691	705-037000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE   (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.   ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____   Date _____

Typed or printed name _____   Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 1279 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1279 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101   or (571)-272-4200.

Notice of Allowability		Application No.	Applicant(s)
		10/618,238	BOUTILIER, CRAIG E.
		Examiner	**Art Unit**
		OLABODE AKINTOLA	3691

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the communication filed on 4/4/2008*.

2. ☒ The allowed claim(s) is/are *1,3-17,22 and 23*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

       1. ☐ Certified copies of the priority documents have been received.

       2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

       3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

       1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 10/07/2004

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

/Hani M. Kazimi/
Primary Examiner, Art Unit 3691

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of invention (claims 1-17 and 22-23) in the reply filed on 04/04/2008 is acknowledged.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Randy Notzed on 04/29/2008.

Claims

1. (Currently amended) A method for enabling optimizing software to determine an optimal allocation in a combinatorial auction, the method comprising computer implemented steps of: (a) receiving a plurality of bids each of which includes a plurality of sub bids, wherein each sub bid is comprised of one of ~~(1)~~ one good and an associated price and ~~(2)~~ a logical operator logically connecting at least two child sub bids and a price associated with the logical operator; (b) defining an objective for the plurality of bids; (c) defining for each bid a plurality of mathematical relationships without logical operators, wherein said mathematical relationships collectively represent the bid; and (d) causing the optimizing software to process the received

bids to achieve the objective subject to the mathematical relationships, <u>wherein step (c) includes,</u> <u>for each sub bid comprised of one good and an associated price, defining: a first mathematical</u> <u>relationship between a pair of Boolean variables that relate the one good being allocated to the</u> <u>bid that includes the sub bid to satisfaction of the sub bid, wherein the sub bid is satisfied when</u> <u>the one good is allocated thereto; and a second mathematical relationship that relates a value of</u> <u>the sub bid to a product of the price of the sub bid times a value of a Boolean variable related to</u> <u>the satisfaction of the sub bid</u>.

2. (Cancelled)

3. (Currently amended) The method of claim 1 ~~2~~, wherein: the first mathematical relationship includes setting ~~(1)~~ the Boolean variable related to satisfaction of the sub bid less than or equal to ($\leq$) ~~(2)~~ the Boolean variable related to the bid including the sub bid being allocated the one good; and the second mathematical relationship includes setting ~~(1)~~ the value of the sub bid $\leq$ ~~(2)~~ the product of the price of the sub bid times the value of a Boolean variable related to the satisfaction of the sub bid.

4. (Currently amended) The method of claim 1, wherein step (c) includes, for each sub bid comprised of a logical operator AND logically connecting at least two child sub bids, defining: a third mathematical relationship that relates ~~(1)~~ a sum of Boolean values related to satisfaction of each child sub bid to ~~(2)~~ a product of the total number of the child sub bids logically connected by the logical operator AND times a Boolean value related to the satisfaction of the sub bid comprised of the logical operator AND, wherein the sub bid comprised of the logical operator AND is satisfied when all of the child sub bids logically connected thereby are satisfied; and a

fourth mathematical relationship that relates (1) a value of the sub bid comprised of the logical

operator AND to (2) a sum of the values of each child sub bid that is satisfied and the price

associated with the sub bid comprised of the logical operator AND, wherein said price is

included in the sum when said sub bid is satisfied, otherwise it is not included in the sum.

5. (Currently amended) The method of claim 4, wherein: the third mathematical relationship

includes setting (1) the product of the total number of the child sub bids logically connected by

the logical operator AND times a Boolean value related to the satisfaction of the sub bid

comprised of the logical operator AND $\leq$ (2) the sum of the Boolean values related to

satisfaction of each of the at least two child sub bids; and the fourth mathematical relationship

includes setting (1) the value of the sub bid comprised of the logical operator AND $\leq$ (2) the sum

of (i) the values of the at least two child sub bids and (ii) the price associated with the sub bid

comprised of the logical operator AND times the Boolean value related to satisfaction of said sub

bid.

6. (Currently amended) The method of claim 1, wherein step (c) includes, for each sub bid

comprised of a logical operator OR or XOR logically connecting at least two child sub bids,

defining: a fifth mathematical relationship that relates (1) a sum of Boolean values related to

satisfaction of each child sub bid to (2) satisfaction of the sub bid comprised of the logical

operator OR or XOR, wherein the sub bid comprised of the logical operator OR or XOR is

satisfied when at least one of the child sub bids logically connected thereby is satisfied, and a

sixth mathematical relationship that relates (1) a value of the sub bid comprised of the logical

operator OR or XOR to (2) a sum of the values of each child sub bid that is satisfied and the

price associated with the sub bid comprised of the logical operator OR or XOR, wherein said

price is included in the sum when said sub bid is satisfied, otherwise it is not included in the sum.

7. (Currently amended) The method of claim 6, wherein: the fifth mathematical relationship

includes setting (1) the satisfaction of the sub bid comprised of the logical operator OR or XOR

.ltoreq.(2) the sum of Boolean values related to satisfaction of each of the at least two child sub

bids; and the sixth mathematical relationship includes setting (1) the value of the sub bid

comprised of the logical operator OR or XOR ≤ (2) the sum of the values of the at least two child

sub bids and the price associated with the sub bid comprised of the logical operator OR or XOR

times the Boolean value related to satisfaction of said sub bid.

8. (Currently amended) The method of claim 1, wherein step (c) includes, for each sub bid

comprised of a logical operator XOR logically connecting the at least two child sub bids,

defining a seventh mathematical relationship that relates (1) an integer value to (2) a sum of

Boolean values related to each child sub bid, wherein each child sub bid that contributes value to

the sub bid comprised of the logical operator XOR is assigned a first Boolean value, otherwise it

is assigned a second Boolean value.

9. (Currently amended) The method of claim 8, wherein the seventh mathematical relationship

includes setting (1) the sum of the Boolean values related to the at least two child sub bids ≤ (2)

the integer value.

10. (Currently amended) The method of claim 1, wherein step (c) includes defining an eighth mathematical relationship for each child sub bid that contributes value to the sub bid comprised of the logical operator XOR, wherein said relationship relates (1) a value of the child sub bid to (2) a product of the Boolean value of said child sub bid times a predetermined value.

11. (Currently amended) The method of claim 10, wherein the eighth mathematical relationship includes setting (1) the value of the child sub bid to (2) the product of the Boolean value of said sub bid times the predetermined value.

14. (Currently amended) The method of claim 1, wherein step (c) includes, for each sub bid for k number of child sub bids, where k is less than a total number of child sub bids available, defining: a ninth mathematical relationship that relates (1) a total number of satisfied child sub bids bid to (2) a sum of Boolean values related to satisfaction of each child sub bid; a tenth mathematical relationship that relates (1) a total number of satisfied child sub bids to (2) a product of k times a Boolean value related to satisfaction of the sub bid; and an eleventh mathematical relationship that relates (1) a value of the sub bid to (2) a sum of the values of each child sub bid that is satisfied and a price associated with the sub bid, wherein said price is included in the sum when said sub bid is satisfied, otherwise it is not included in the sum.

15. (Currently amended) The method of claim 15 14, wherein the ninth mathematical relationship includes setting (1) the total number of satisfied child sub bids ≤ (2) the sum of

Boolean values related to satisfaction of each child sub bid; the tenth mathematical relationship

includes setting (1) the product of k times the Boolean value related to satisfaction of the sub bid

≤ (2) the total number of satisfied child sub bids; and the eleventh mathematical relationship

includes setting (1) the value of the sub bid ≤ (2) the sum of the values of each child sub bid that

is satisfied and the price associated with the sub bid times a Boolean value related to satisfaction

of the sub bid.

16. (Currently amended) The method of claim 1, wherein step (c) includes: for each sub bid

comprised of one good and an associated price, defining: a first mathematical relationship

between a pair of Boolean variables that relate (1) the one good being allocated to the bid that

includes the sub bid to (2) satisfaction of the sub bid, wherein the sub bid is satisfied when the

one good is allocated thereto, and a second mathematical relationship that relates (1) a value of

the sub bid to (2) a product of the price of the sub bid times a value of a Boolean variable related

to the satisfaction of the sub bid; for each sub bid comprised of a logical operator AND logically

connecting at least two child sub bids, defining: a third mathematical relationship that relates (1)

a sum of Boolean values related to satisfaction of each child sub bid to (2) a product of the total

number of the child sub bids logically connected by the logical operator AND times a Boolean

value related to the satisfaction of the sub bid comprised of the logical operator AND, wherein

the sub bid comprised of the logical operator AND is satisfied when all of the child sub bids

logically connected thereby are satisfied, and a fourth mathematical relationship that relates (1) a

value of the sub bid comprised of the logical operator AND to (2) a sum of the values of each

child sub bid that is satisfied and the price associated with the sub bid comprised of the logical

operator AND, wherein said price is included in the sum when said sub bid is satisfied, otherwise

it is not included in the sum; for each sub bid comprised of a logical operator OR or XOR

logically connecting at least two child sub bids, defining: a fifth mathematical relationship that

relates (1) a sum of Boolean values related to satisfaction of each child sub bid to (2) satisfaction

of the sub bid comprised of the logical operator OR or XOR, wherein the sub bid comprised of

the logical operator OR or XOR is satisfied when at least one of the child sub bids logically

connected thereby is satisfied, and a sixth mathematical relationship that relates (1) a value of the

sub bid comprised of the logical operator OR or XOR to (2) a sum of the values of each child sub

bid that is satisfied and the price associated with the sub bid comprised of the logical operator

OR or XOR, wherein said price is included in the sum when said sub bid is satisfied, otherwise it

is not included in the sum; for each sub bid comprised of a logical operator XOR logically

connecting the at least two child sub bids, defining: a seventh mathematical relationship that

relates (1) an integer value to (2) a sum of Boolean values related to each child sub bid, wherein

each child sub bid that contributes value to the sub bid comprised of the logical operator XOR is

assigned a first Boolean value, otherwise it is assigned a second Boolean value, and an eighth

mathematical relationship for each child sub bid that contributes value to the sub bid comprised

of the logical operator XOR, wherein said relationship relates (1) a value of the child sub bid to

(2) a product of the Boolean value of said child sub bid times a predetermined value; and for

each sub bid for k number of child sub bids, where k is less than a total number of child sub bids

available, defining: a ninth mathematical relationship that relates (1) a total number of satisfied

child sub bids to (2) a sum of Boolean values related to satisfaction of each child sub bid; a tenth

mathematical relationship that relates (1) a total number of satisfied child sub bids to (2) a

product of k times a Boolean value related to satisfaction of the sub bid; and an eleventh

mathematical relationship that relates (1) a value of the sub bid to (2) a sum of the values of each

child sub bid that is satisfied and a price associated with the sub bid, wherein said price is

included in the sum when said sub bid is satisfied, otherwise it is not included in the sum.

18-21. (Cancelled)

22. (Currently amended) A computer-readable medium having stored thereon instruction which,

when executed by a processor, cause the processor to perform the steps of: (a) receive a plurality

of bids each of which includes a plurality of sub bids, wherein each sub bid is comprised of one

of (1) one good and an associated price and (2) a logical operator logically connecting at least

two child sub bids and a price associated with the logical operator; (b) define an objective for the

plurality of bids; (c) define for each bid a plurality of mathematical relationships without logical

operators, wherein said mathematical relationships collectively represent the bid; and (d) process

the received bids subject to the mathematical relationships to achieve the objective, wherein step

(c) includes: for each sub bid comprised of one good and an associated price, define: a first

mathematical relationship between a pair of Boolean variables that relate the one good being

allocated to the bid that includes the sub bid to satisfaction of the sub bid, wherein the sub bid is

satisfied when the one good is allocated thereto, and a second mathematical relationship that

relates a value of the sub bid to a product of the price of the sub bid times a value of a Boolean

variable related to the satisfaction of the sub bid

23. (Currently amended) The computer-readable medium of claim 22, wherein step (c) includes, ~~includes: for each sub bid comprised of one good and an associated price, define: a first mathematical relationship between a pair of Boolean variables that relate (1) the one good being allocated to the bid that includes the sub bid to (2) satisfaction of the sub bid, wherein the sub bid is satisfied when the one good is allocated thereto, and a second mathematical relationship that relates (1) a value of the sub bid to (2) a product of the price of the sub bid times a value of a Boolean variable related to the satisfaction of the sub bid~~ for each sub bid comprised of a logical operator AND logically connecting at least two child sub bids, define: a third mathematical relationship that relates (1) a sum of Boolean values related to satisfaction of each child sub bid to ~~(2)~~ a product of the total number of the child sub bids logically connected by the logical operator AND times a Boolean value related to the satisfaction of the sub bid comprised of the logical operator AND, wherein the sub bid comprised of the logical operator AND is satisfied when all of the child sub bids logically connected thereby are satisfied, and a fourth mathematical relationship that relates ~~(1)~~ a value of the sub bid comprised of the logical operator AND to ~~(2)~~ a sum of the values of each child sub bid that is satisfied and the price associated with the sub bid comprised of the logical operator AND, wherein said price is included in the sum when said sub bid is satisfied, otherwise it is not included in the sum; for each sub bid comprised of a logical operator OR or XOR logically connecting at least two child sub bids, define: a fifth mathematical relationship that relates ~~(1)~~ a sum of Boolean values related to satisfaction of each child sub bid to ~~(2)~~ satisfaction of the sub bid comprised of the logical operator OR or XOR, wherein the sub bid comprised of the logical operator OR or XOR is

satisfied when at least one of the child sub bids logically connected thereby is satisfied, and a sixth mathematical relationship that relates (1) a value of the sub bid comprised of the logical operator OR or XOR to (2) a sum of the values of each child sub bid that is satisfied and the price associated with the sub bid comprised of the logical operator OR or XOR, wherein said price is included in the sum when said sub bid is satisfied, otherwise it is not included in the sum; for each sub bid comprised of a logical operator XOR logically connecting the at least two child sub bids, define: a seventh mathematical relationship that relates (1) an integer value to (2) a sum of Boolean values related to each child sub bid, wherein each child sub bid that contributes value to the sub bid comprised of the logical operator XOR is assigned a first Boolean value, otherwise it is assigned a second Boolean value, and an eighth mathematical relationship for each child sub bid that contributes value to the sub bid comprised of the logical operator XOR, wherein said relationship relates (1) a value of the child sub bid to (2) a product of the Boolean value of said child sub bid times a predetermined value; and for each sub bid for k number of child sub bids, where k is less than a total number of child sub bids available, define: a ninth mathematical relationship that relates (1) a total number of satisfied child sub bids to (2) a sum of Boolean values related to satisfaction of each child sub bid; a tenth mathematical relationship that relates (1) a total number of satisfied child sub bids to (2) a product of k times a Boolean value related to satisfaction of the sub bid; and an eleventh mathematical relationship that relates (1) a value of the sub bid to (2) a sum of the values of each child sub bid that is satisfied and a price associated with the sub bid, wherein said price is included in the sum when said sub bid is satisfied, otherwise it is not included in the sum.

Allowable Subject Matter

Claims 1, 3-17 and 22-23 are allowed.

Examiner's Statement of Reason for Allowance

The following is a statement of reasons for the indication of allowable subject matter.

The most relevant reference is the *Sandholm* reference.

Sandholm reference teaches a) A combinatorial auction method comprising: (a) receiving a plurality of bids each of which includes a plurality of sub bids, wherein each sub bid is comprised of one of one good and an associated price and a logical operator logically connecting at least two child sub bids and a price associated with the logical operator; (b) defining an objective for the plurality of bids.

The *Sandholm* reference fails to teach

defining for each bid a plurality of mathematical relationships without logical operators, wherein said mathematical relationships collectively represent the bid; and (d) causing the optimizing software to process the received bids to achieve the objective subject to the mathematical relationships, wherein step (c) includes, for each sub bid comprised of one good and an associated price, defining: a first mathematical relationship between a pair of Boolean variables that relate the one good being allocated to the bid that includes the sub bid to satisfaction of the sub bid, wherein the sub bid is satisfied when the one good is allocated thereto; and a second mathematical relationship that relates a value of the sub bid to a product of the price of the sub

bid times a value of a Boolean variable related to the satisfaction of the sub bid.

Updated searches revealed no references that disclosed the claimed invention, nor were any further references identified which could be reasonable combined with *Sandholm* reference. For this reason, claims 1 and 32 are deemed to be allowable over prior art of record and claims 3-17 and 23 are allowed by dependency.

Any comments considered necessary by the applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reason for Allowance".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Olabode Akintola whose telephone number is 571-272-3629. The examiner can normally be reached on M-F 8:30AM -5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Kalinowski can be reached on 571-272-6771. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

OA

/Hani M. Kazimi/
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